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Pesticide Fact Sheet Number 55: Dipropetryn

(U.S.) Environmental Protection Agency
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U.S. Department of Commerce
National Technical Information Service
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United States
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Agency

Office of Pesticides and Toxic Substances
Office of Pesticide Programs (TS-766C)
Washington, DC 20460

EPA

Pesticide Fact Sheet

PB87-114245

Name of Chemical: DIPROPETRYN
Reason for Issuance:
Date Issued: June 30, 1985
Fact Sheet Number: 55

1. Description of the chemical:

Generic name: 2(ethylthio)-4,6-bis(isopropylamino)-s-triazine,
Empirical formula: $C_{11}H_{21}N_5S$
Common name: Dipropetryn
Trade name: Sancap®, Cototar® and GS-16068.
Chemical Abstracts Service (CAS) Registry number: 4147-51-7
Office of Pesticides Program's EPA Chemical Code Number: 104401
Year of initial registration: 1973
Pesticide type: Herbicide
Chemical family: S-triazine
U.S. producer: Ciba-Geigy Corporation

2. Use patterns and formulations:

Application sites: Dipropetryn is registered for preemergence control of pigweed and Russian thistle on cotton. In addition, dipropetryn is registered for use only on cotton grown on the sandy soils in Oklahoma, Texas, Arizona and New Mexico.

Type of formulation: Dipropetryn is available in a wettable powder formulation.

Types and methods of applications: Dipropetryn can be banded or broadcast applied to the soil surface with ground equipment or broadcast applied with aerial equipment as a preemergence spray.

Application rates: 1.2 to 2.0 lbs a.i./A on crop sites.

Usual carriers: Water.

3. Science Findings:

Summary science statements:

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, Science Findings

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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Dipropetryn is not acutely toxic by the oral, dermal, and eye irritation routes of exposure. The available data are insufficient to show that any of the risk criteria listed in § 162.11(a) of Title 40 of the U.S.Code of Federal Regulations have been met or exceeded for the uses of dipropetryn at the present time. There are no valid chronic toxicity and mutagenicity studies for dipropetryn. There are also extensive residue chemistry and environmental fate data gaps.

Available data indicate that dipropetryn is slightly toxic to birds and moderately toxic to fish and freshwater invertebrates. A detailed ecological hazard assessment cannot be made until certain environmental chemistry data requirements are fulfilled.

Chemical characteristics:

Dipropetryn is a solid at room temperature. Its molecular weight is 255.40. The melting point is 104-106°C. Dipropetryn is soluble in water (at 20°C) to 16.0 ppm and soluble in aromatic and chlorinated hydrocarbon solvents.

Toxicological characteristics:

Acute toxicity effects of dipropetryn are as follows:

Acute Oral Toxicity in rats: >2,197 mg/kg body weight, Toxicity Category III
Acute Dermal Toxicity in rabbits: >10,000 mg/kg body weight, Toxicity Category IV
Acute Inhalation Toxicity in rats: >320 mg/l (4 hour exposure) Toxicity Category IV
Skin irritation in rabbits: Not an irritant, Toxicity Category IV
Eye irritation in rabbits: Not an irritant, Toxicity Category IV.

Subacute toxicity effects on dipropetryn are as follows:

A 19-week rat feeding study and a 14-week dog feeding study indicated effects on various organs at 1200 ppm dosage (the Lowest Effect Level). The No Observable Effect Level is 400 ppm.

Chronic toxicological effects of dipropetryn have not been evaluated because there are no valid chronic toxicity studies in both the rat and dog, oncogenicity studies in both the rat and mouse, teratogenicity studies in both the rat and rabbit, a two-generation reproduction study in the rat; a general rat metabolism study; and no mutagenicity tests (gene mutation in bacteria, gene mutation in mammalian cells in culture, chromosomal aberration analysis in mammalian cells in culture, or DNA damage in mammalian cells in culture).

Major routes of human exposure:

Non-dietary exposure to dipropetryn by a farmer as an applicator during mixing, loading, spraying and flagging is possible.

Physiological and biochemical behavioral characteristics:

Absorption characteristics: Dipropetryn appears to penetrate foliage rapidly, minimizing removal from foliage by rain.
Translocation: Readily translocated through the xylem from roots and foliage, accumulating in the apical meristems and leaf tips.
Mechanism of pesticidal action: Dipropetryn inhibits photolysis of water in the photosynthetic process.
Metabolism in plants: In cotton, dipropetryn's total residues are evenly distributed in the seed with crude oil extracts containing less than the intact seed.

Environmental characteristics:

Adsorption and leaching in basic soil types: Dipropetryn is more readily adsorbed on soils with high clay and organic matter content. Dipropetryn and other alkylthios-triazines are adsorbed to a greater extent than most other commercial triazines.
Microbial breakdown: Soil microorganisms do appear to play a significant role in degradation of dipropetryn.
Loss from photodecomposition and/or volatilization: Slight losses.
Average persistence at recommended rates: When used at recommended rates under normal environmental conditions, dipropetryn's residual activity is from 1 to 3 months.

Ecological characteristics:

Avian acute oral toxicity: >1,000 mg/kg.
96-hour fish toxicity): 3.130 ppm for bluegill sunfish (moderately toxic), and 2.430 ppm for rainbow trout (moderately toxic).

Potential problem for endangered species:

The Agency has evaluated dipropetryn under the cotton cluster/use patterns. Available data show a low order of dipropetryn toxicity suggesting that the potential hazard to endangered species is low.

Currently, there are no identifiable endangered plants that would be affected by dipropetryn.

The Agency believes that the conventional labeling for dipropetryn is adequate to properly inform the users on how to protect any endangered species.

Tolerance assessments:

Data are not available for calculating the Acceptable Daily Intake (ADI) for dipropetryn.

The Agency is unable to complete a full tolerance reassessment because the available dipropetryn toxicology and residue data do not fully support the established tolerance listed below. The metabolism of dipropetryn in animals and plants is not fully understood. Therefore, the Agency is requiring data on the metabolism of dipropetryn and related metabolite(s) in crops and animals. Additional long term rodent and nonrodent toxicological studies are also required. The additional data will be used to assess dietary exposure to dipropetryn and may lead to revisions in the existing tolerance. The Agency will not grant any significant pending or new tolerances for dipropetryn until the data are submitted.

Commodities	Parts per million
Cottonseeds	0.1

International Tolerances

Presently, there are no tolerances for residues of dipropetryn in Canada, Mexico, or in the Codex Alimentarius.

Problems known to have occurred with use:

The Pesticide Incident Monitoring System (PIMS) does not indicate any incident involving agricultural uses of dipropetryn.

4. Summary of regulatory position and rationale:

Based on the review and evaluation of all available data and other relevant information on dipropetryn the Agency has made the following determinations:

The available data are insufficient to show that any of the risk criteria listed in § 162.11(a) of Title 40 of the U.S.Code of Federal Regulations have been met or exceeded for the uses of dipropetryn at the present time.

The Agency has concerns about dipropetryn's lack of chronic toxicity data and its use on a food and feed crop when it is structurally related to certain other s-triazine pesticides which are known to be potential ground water contaminants and to cyanazine, a s-triazine pesticide that may be regulated as a teratogen.

The Agency will not allow any significant new uses to be established for dipropetryn until the toxicological, residue chemistry, and ground water data deficiencies identified in the registration standard have been satisfied.

The Agency is imposing restrictions on rotational crops. The extent of the restrictions will be reconsidered when additional data are received.

Specific label precautionary statements:

Hazard Information

The human precautionary statements must appear on all manufacturing-use products (MPs) labels as presribed in 40 CFR 162.10.

Environmental Hazard Statements

All MPs intended for formulation into end-use products (EPs) must bear the following statements:

"This pesticide is toxic to fish. Do not discharge effluent containing this product directly into lakes, streams, ponds, estuaries, oceans or public waters unless this product is specifically identified and addressed in a National Pollutant Discharge Elimination System (NPDES) permit. Do not discharge effluent containing this product into sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the Environmental Protection Agency".

"Do not apply directly to water. Do not contaminate water by cleaning of equipment or disposal of wastes. In case of spills, cover or incorporate spills."

Restrictions on Rotational Crops

"Do not plant food and feed crops in dipropetryn-treated fields unless dipropetryn is authorized for use on those crops".

5. Summary of major data gaps and due dates:

The following toxicological studies are required:

A 90-day inhalation study (October 30, 1986),
Chronic toxicity studies and oncogenicity studies (September 30, 1989),
Teratology studies (October 30, 1986),
A two generation reproduction study (October 30, 1988),
Mutagenicity data (April-July 1986), and
A general metabolism study (July 30, 1987).

The following environmental fate data are required:

A hydrolysis study (April 30, 1986),
Photodegradation studies in water and on soil (April 30, 1986),
Metabolism tests in aerobic soil and in anaerobic soil (October 30, 1986),
A mobility test involving leaching and adsorption/desorption (July 30, 1986),
Accumulation studies on rotational crops (confined: October 30, 1988 and field: September 30, 1989), and
An accumulation study in fish (July 30, 1986).

The following ecological effects data are required:

Two subacute dietary studies (April 30, 1986), and
An acute freshwater invertebrate toxicity study (April 30, 1986).

Product chemistry data are required during 1986.

The following residue chemistry data are required:

Additional plant metabolism data (July 30, 1987), and
Metabolism studies utilizing ruminants and chickens (January 30, 1987).

6. Contact Person at EPA:

Robert J.Taylor (703) 557-1800
Office of Pesticide Programs, EPA,
Registration Division (TS-767C)
Fungicide-Herbicide Branch
401 M Street., S.W.
Washington, DC 20460.
Telephone (703) 557-1800

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